Claims

1. A method for computing a Wave Transfer Vector based on the reciprocity principle, comprising the steps of:

simulating positioning of a monopole, omnidirectional wave energy source at a reference position remote from a body;

computing a boundary oscillation amplitude of the wave generated by the source at a surface of the body; and

deriving from the boundary oscillation amplitude said Wave Transfer Vector.

2. The method of claim 1 wherein the computing step is carried out by a numerical method.

3. The method according to claim 2 wherein the numerical method is one of: a finite element method, a combination of the finite and infinite element methods, a direct boundary element method, a direct multi-domain boundary element method, an indirect boundary element method

4. The method according to claim 1, wherein wave source is an acoustic source.

5. The method according to claim 1 further comprising a step of computing an additional Wave Transfer Vector comprising:

computing at least a first and a second wave transfer vector at a first and a second predetermined frequency, respectively, and

computing the additional Wave Transfer Vector at a frequency intermediate the first and second frequency by interpolation between the first and second Wave Transfer Vectors.

6. The method of claim 5 wherein the interpolation technique is one of a polynomial interpolation mechanism and a spline interpolation mechanism.

7. The method according to claim 1 wherein the Wave Transfer Vector is an Acoustic Transfer Vector, further comprising the step of computing a Modal Acoustic Transfer Vector (MATV) from an acoustic transfer vector (ATV) in an alternative coordinate system defined by a set of deformed shapes of a body, comprising:

projecting the ATV into the alternative coordinate system.

8. The method of claim 7 further comprising the step of:

using the MATV to predict a response of the body or the effect of such a response at a reference point remote from the body.

9. A processing engine adapted to carry out any of the methods of claim 1 to 8.

10. A computer program product for executing on a computer, the computer program product executing any of the method steps of claim 1 to 8 when executed on the computer.

11. A method of inputting at a near terminal a representation of a body and coordinates of a reference point and transmitting these to a remote terminal running a program for executing any of the methods of claim 1 to 8, and receiving at a near location an output of any of the methods.

12. The method according to claim 11, wherein the output is one of:

an ATV, an oscillation amplitude such as an acoustic pressure level, a surface vibration of the body, a revised design of at least a part of the body.

13. A computer system for computing a Wave Transfer Vector based on the reciprocity principle, comprising:

means for simulating positioning of a monopole, omnidirectional wave energy source at a reference position remote from a body;

means for computing a boundary oscillation amplitude of the wave generated by the source at a surface of the body; and

means for deriving from the boundary oscillation amplitude said Wave Transfer Vector.

14. The computer system according to claim 13, further comprising means for computing an additional Wave Transfer Vector at a frequency intermediate a first and second frequency by interpolation between a first and a second Wave Transfer Vector at th first and second frequencies.

15. The computer system according to claim 13 or 14, wherein the Wave Transfer Vector is an Acoustic Transfer Vector, further comprising: means for computing a Modal Acoustic Transfer Vector (MATV) from an acoustic transfer vector (ATV) in an alternative coordinate system defined by a set of deformed

shapes a body by projecting the ATV into the modal space.